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ABSTRACT

This paper explores the research of the learning styles manifested in the middle school classroom and the implications those differences have to a successful teaching-learning paradigm. Various projects in the field are examined, including how students are profiled, how instructional methods can be modified to suit the needs of each learner, and changes in the outer environment to ensure the strengths and weaknesses of the students are addressed. The problems inherent in any attempt to meet the profile of every student are discussed, among which are the necessity to alter preferred teaching styles and to offer many resources for learning a given unit. The benefits to utilizing learning styles in the educational format are presented, including students being better able to develop creativity and ability to reason, draw abstractions, analyze, give personal meaning to what they are learning, and to express themselves in powerful and self-fulfilling ways. These aspects are in keeping with the stated theories of human development experts, such as Piaget, Erikson, Bandura, and Maslow, among others. Contains 27 references. (Author/EH)

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A STUDY OF LEARNING STYLES:

THE IMPORTANCE OF INDIVIDUAL LEARNING PREFERENCES, THE PROCEDURES TO ACCOMMODATE THOSE PREFERENCES IN THE CLASSROOM, AND HOW HUMAN DEVELOPMENT RESEARCH HAS IMPACT ON THE PROCESS

SUBMITTED BY:

LOIS E. JORDAN, PH.D
1993

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ABSTRACT:

An exploration of the learning styles manifested in the middle school classroom and the implications differences have to a successful teaching-learning paradigm. Various projects in the field are examined, including how students are profiled, how instructional methods can be modified to suit the needs of each learner, and changes in the outer environment to ensure the strengths and weaknesses of the students are addressed. The problems inherent in any attempt to meet the profile of every student are discussed, among which are the necessity to alter preferred teaching styles and offer many resources for learning a given unit. The benefits to utilizing learning styles in the educational format are brought out. Students are better able to develop creativity and ability to reason, draw abstractions, analyze, give personal meaning to what they are learning, and to express themselves in powerful and self-fulfilling ways. These aspects are in keeping with the stated theories of human development experts such as Piaget, Erikson, Bandura, and Maslow among others.

Introduction. In the recent past, much educational research has been devoted to the study of questions pertinent to specific learning styles. At the same time, issues surrounding Aptitude Treatment Interaction have been explored in some depth. As a result of these efforts, the knowledge base in the area has broadened considerably, permitting the development of hypotheses about how an individual is apt to learn most easily and remember longer. Explanations may also be posited concerning the methods, resources, and environment most appropriate to that individual's learning style.

The term "learning style" evokes a highly complex definition; although stipulated as consisting of a "biologically and developmentally imposed set of characteristics that make the same teaching method wonderful for some and terrible for others," (Dunn & Griggs, 1989, p. 10), a myriad of variables ranging from personal responses to classroom organization and teaching style, from a student's motivation and task persistence to his/her hemisphericity demand inclusion, complicating the research process.

Similarly, the search for Aptitude Treatment Interactions (ATIs) revolves around an intricate interplay required in planning educational strategies predicated on individual strengths and weaknesses. Many studies then have concentrated determining how those students who may most benefit from one teaching method may be consistently and accurately identified from those who will not. Some research has examined instructional approaches which address the deficits and not the strengths of the individual.

In the pages that follow, some of the research studies in the two areas will be described in some detail. It is expected that such a discussion might demonstrate that the intellectual processes of selecting teaching practices, adapting instructional materials, reading the students' responses, and modulating environments to generate student learning energy "are the critical elements that determine whether a teaching practice will have effect on specific learning styles." (Showers, Joyce & Bennett, 1987, p. 85). Insight may be furnished too on the discovery or arrangement of "alternative instructional treatments that fit differing students' aptitude patterns so that common goal attainment is maximized for each student." (Snow, 1984, p. 13).

Learning Style Theory. In 1982, the National Association of Secondary School Principals (NASSP) began devising a learning style model; this entailed a thorough review of learning styles theory and research. The resultant NASSP learning styles paradigm described by Keefe & Ferrell (1990, p. 57) evolved from three sources: (1) personality theory; (2) the information processing aspect of cognitive style research; and (3) research on aptitude treatment interaction. The contribution of personality theory to the model is perceived as reflected in the individual's characteristic cognitive, affective, and environmental functioning. Drawing on the findings of Gregorc & Ward (1977, pp. 20-26), the NASSP model hypothesized three types of learning style tendencies in the area of in-

formation processing: (1) an inherent natural learning style; (2) a synthetic strenght, which becomes a part of the individual's functioning; and (3) an adopted artificial style, which never becomes a part of the individual's typical functioning. "Although an individual's style is not subject to fundamental change, it is subject to modification." (Reissman, 1964, pp. 484-489). In analyzing aptitude-treatment interaction, the NASSP, found a "systematic attempt to relate individual differences in aptitude, including aspects of cognitive and affective style, to instructional method," formed the rationale for research. (Keefe & Ferrell, p. 58). Hence, aptitudes in general interact with instructional treatment of affect student learning. Keefe & Languis (1983) noted that the task force defined learning style as "the composite of characteristic cognitive, affective, and physiological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment....."

Dunn & Griggs (p. 9) held that regardless of a model such as that formulated by the NASSP, "learning styles are unique and different." Extensive research indicate that when students are approached via teaching methods dictated by their learning style, the results are higher test scores , improved attitudes toward school and learning, and improved discipline. Studies document how well students learn when their personal learning styles are targeted and how poorly that performance becomes when the methods selected do not complement those idiosyncratic modes of cognition.

R. Dunn (1990, p. 15), an eminent pioneer in the field, noted

that "students are not failing because of the curriculum." Indeed, they are capable of learning "almost any subject matter when they are taught with methods and approaches responsive to their learning style strengths." The author addressed the problem of multiple models of learning styles by pointing out the many similarities which exist, for example, each "advocating acknowledging and honoring the diversity among individuals." Further, most models stress that teachers "adapt instruction to the ways in which individuals, rather than groups learn." And while most models focus on one or two characteristics arranged along a continuum, several are quite comprehensive, employing a number of characteristics and their respective importance to learning style. (Dunn, p. 15).

Marshall (1990, p. 62) sees in learning style theory a means of "explaining individual differences and a way to manipulate classroom conditions to support those differences." It is possible to utilize the concept of teaching to style in shifting the traditional philosophy of teaching: if students cannot learn in the ways they are taught, then they must be taught the way they learn. A framework thus evolves suitable to the new emphasis on individualism in education and to the increasingly diverse student population. The modifications possible are capable of encompassing both the gifted student and the mildly handicapped. Some proponents, found O'Neil (1990, p. 5) believe that it is "at-risk" students, those with behavioral, educational, or family problems, who have the most to gain when style-based learning techniques are embraced. Alternative methodologies may equate with success.

Instruments Designed to Assess Specific Learning Styles. Several instruments critical to any defense of learning style paradigms seek to identify student style, strengths, weaknesses, and preferences---all integral to any subsequent modification of instruction for the individual. The Jungian-based Myers-Briggs Type Indicator purports to diagnose "students' preferences for perceiving meaning, expressing values and commitment, and interacting with the world." (Keefe & Ferrell (p. 57). The elements of personality traits drawn from Jung's postulations---two functions for perceiving: sensing and intuition---two for making judgments: thinking and feeling---and two orientations to concepts and tasks: introversion and extraversion---only indirectly assess learning styles, "reflecting typical cognitive, affective, and environmental functioning rather than more distinct constructs. (Keefe & Ferrell, p. 57).

The Learning Style Profile emerged from the task force of the National Association of Secondary School Principals. Consisting of 126 items, the Profile considers perceptual, cognitive, affective, and environmental characteristics. Skills, preferences, and orientations form the assessed elements of learning style. Factor analysis was utilized extensively in order to ensure a strong relationship between the instrument and the learning style model. It is asserted that the test is successful in measuring the traits and characteristics associated with learning styles validly and reliably. (Keefe & Ferrell, p. 60).

The Dunn, Dunn, and Price Learning Style Inventory is

called by R. Dunn (p. 16), "the most reliable, most valid, and most widely used learning style diagnostic instrument for school-aged children in the United States." It assesses multiple characteristics which have been proven to correlate with and significantly affect student performance. Used on every grade level, it is simple to administer and score and is inexpensive. Its developers assert that students understand it and are not intimidated by the questions. Learning strengths and weaknesses are indicated in a "profile" format. Cohen (1987, p. 18) wrote that the Learning Style Inventory assesses student preferences in the following areas: (1) environmental---for instance, sound, light, and temperature levels; (2) emotional---including motivation, responsibility, persistence, and need for structure/flexibility; (3) sociological---preference to work alone, with peers, or directed by adults; and (4) physical---preferences for time of day, mobility, and intake, together with auditory, visual, tactile, and/or kinesthetic preferences. Although it does not evaluate underlying psychological elements or cognitive processes, it does demonstrate how students prefer to learn, together with the conditions most condusive to individual achievement. Patterns of learning preferences are evoked in the four areas of assessment.

Still another instrument is the Kolb Learning Style Inventory which identifies four styles: (1) divergers: prefer to grasp experience through the concrete, transforming it via reflective

observation. Strength rests in imaginative ability. Good at generating ideas; people-oriented; (2) assimilators: experience via abstract conceptualization, transformed through reflective observation. Strength is in creating theoretical models and interest in abstract conceptualization; (3) convergers: grasp experience through abstract conceptualization, transforming it through active experimentation; move quickly to find one correct answer, prefer dealing with things, not people; and (4) accommodators: grasp experience through concrete experience, transforming it through active experimentation. Focus on doing things, having new experiences, risk-taking, do well in adapting to new circumstances. (Davis, Murrell & Davis, 1988, pp. 6-7).

The above instruments represent several of those presently available for diagnostic assessment of individual learning style. According to Dunn (1989, pp. 50-58), learning styles must be identified with an instrument because "teachers cannot correctly identify all the characteristics of learning style. Some aspects of style defy the observation of even the most experienced educator." Further, teachers frequently misjudge behaviors or fail to interpret symptoms. Among others, DeBello (1990), has issued a report which evaluates the reliability and validity of the various instruments. It is readily conceded by those in the field that it is critical to utilize not only an instrument which has been proven reliable and valid, but also one appropriate to the age group being assessed.

Aptitude Treatment Interaction Theory. ATI theory is concerned with realting individual differences in aptitude, among which are the various facets of cognition and affective style, with instructional method. Aptitude implies that individuals differ in the amount of a trait they possess." The stress in on the idea of variability among individuals. (Keefe & Ferrell, 1990, p. 58). Both cognitive and learning style characteristics have been explored in the course of ATI research; in the process, considerable blurring of the two terms has occurred. Often the terms are used interchangeably, although the definition of "cognitive style" posited by Allport (Keefe, 1979), applies to a "quality of living and adapting manifested by distinctive personality types." Although disagreement exists as to the proper relationship of the two terms, ATI theory postulates that research dealing with cognitive style can be linked to learning styles. Learning styles is a type of aptitude treatment interaction. "Aptitude-treatment interactions suggest that a person's distinctive characteristics or aptitudes can be matched to a specific treatment---instructional method---resulting in a statistical interaction (a more effective outcome than could otherwise be achieved." (Snider, 1990, p. 53).

According to Snow & Lohman (1984, p. 349), most important to any aptitude theory, "the demonstration of ATI suggests how the power of experimental manipulation can be brought to bear on the interpretation of the aptitude construct." The aim of

the educational unit is to provide alternative instructional treatments to fit the major differences in aptitude among the student population. The overall goal is to go around the enduring inaptitudes while the most crucial aptitudes are taken advantage of. Learning skills and strategies would be built up in those students deficiently equipped for any of the alternative instructional treatments offered. (Snow & Lohman, p. 350).

Cronbach & Snow (1977) stated that if the "prescriptive goal concerns the direct development of aptitude, then the decision rules specify procedures to be followed in training in the particular situation." Standards to assess its success are also mandated. Atpitude theory must support the selection of educational methodology employed in a given situation. Any selection requires full cognizance of the inherent nature of aptitudes as perceived from the purview of aptitude theory. That is, aptitudes are looked upon as artifacts. "An aptitude construct represents an interface between an inner environment, the substance of the artifact itself, and an outer environment in which it operates." (Snow & Lohman, p. 348). Only when the inner and outer environment are in accord does the artifact serve its purpose and the goal is reached. Any disharmony in the environments results in inaptitude. Either the inner or outer environment may be redesigned in order to improve ability to reach performance goals.

Several examples of redesign may be briefly considered. When

cognitive aspects are analyzed, lesson plans may be formulated with these factors in mind. Thus, some students are global in cognition; they must see the larger format before they are able to focus on details. Others are analytic; they need to learn successively in small steps, one detail following another. (Brunner & Majewski, 1990, p. 22). Reducing instructional complexity by treatment redesign "or by providing direct training in learning strategies or in component cognitive skills helps avoid or overcome some inadequacies of the inner environment of lower aptitude students." (Snow & Lohman, p. 359). The problem is addressed either by making the treatment, the outer environment, do what they cannot themselves achieve, or by training the inner environment in some responses necessary for the success of the treatment. Consideration of expository versus discovery learning is also suggested as a possibility in the creation of treatment models.

Research in the Areas of Learning Styles and Aptitude Treatment Interaction. As in other educational areas, studies involving learning styles and aptitude treatment interaction have drawn criticism as well as ardent advocacy. The strength of research findings has been at times called into question on several grounds: self-interest among those reporting on the models; too few "real" scholarly research efforts, with most of the findings emerging in the form of doctoral dissertations; and the belief among some authorities that any gains may be short-lived or have little to do with matching instruction with student preference. (O'Neil, p. 7).

Although a massive body of large-scale studies, replete with experimental and control groups may not as yet have been amassed, R. Dunn (p. 16), notes that learning styles research at St. John's University in particular has been primarily experimental research. "Some of the experimental studies involved two or more equivalent groups of subjects treated differently; in others, one group of subjects received multiple treatments." Nor is control lacking in such elements as random assignments of subjects to treatments or in use of pretesting. Too, well-designed doctorial dissertations are not necessarily inferior to other types of research. It may be argued, as Dunn concludes, that such investigations, undertaken by those thoroughly conversant with nuances in the area is superior than large-scale studies attempted by those without such knowledge. Let us briefly examine some of the research efforts to discover what has been ascertained about the effect of learning styles preferences and aptitude treatment interaction on student performance.

At Frontier Central High School in Hamburg, New York, mildly handicapped students in grades 9-12 began using the learning styles model developed by R. & K. Dunn. Student styles were assessed via the Learning Style Inventory. The twenty-one learning style elements of the model, utilizing five stimuli---environmental, emotional, sociological, physical, and psychological---formed the instructional foundation, with that instruction presented through the individual's primary perceptual strength, reinforced through his secondary strength, and reinforced again through her

tertiary strength. Classrooms were redesigned to address environmental factors; emotional stimuli---motivation, persistence, responsibility, structure---were dealt with through instructional strategies and lesson designs; sociological elements were incorporated in unit plans and lesson designs; physical elements such as preference of intake, time of day, and mobility were considered together with attention to perceptual strengths of each student. Cognitive aspects were organized according to individual characteristics relating to global or analytic preference in learning style. The results of the alterations are impressive: in 1987, before introduction of the new curriculum, only 25 percent of the students passed the needed tests to receive diplomas; during the first year of the program, 66 percent passed the exams. And in 1989-90, the results reached 90 percent, a higher ratio than achieved by regular education students. (Brunner & Majewski, pp. 21-22).

A rather similar observation-type study recorded by Perrin (1990, pp. 23-24) detailed the findings of a Dunn & Dunn model used among potential dropouts in the Amityville High School in New York. Students were selected for the program at the end of 9th grade on the basis of failure in two or three subjects, socres in the fifth stanine of below on a standardized reading test, and excessive absenteeism. Grouped together for the regular school day, classes experimented with alternative groupings, varied instructional strategies and student activities. The Learning Style Inventory was given to discover learning strengths and weaknesses. At the

end of the 10th grade, only one student having opted out of the project, GPAs reflected mean increases of 18 points in English, 8 in social studies, 4 in math, and 10 in science over their 9th grade GPAs. They continued the program in 11th grade, and more than 50 percent applied to colleges.

The above examples are typical of studies conducted on learning styles preference and perceived relationship to student achievement. The research is centered on a particular school or grade, it is short-term, and employs a single means of assessment. There is scant evidence that matching instructional strategies to students' preferences is the sole reason for the product outcome. It is difficult to discern if the results are consistent over time, across student populations, and across other classrooms with other learning strategies, environmental adaptations and so forth.

Some of the available research focuses on a single aspect of learning styles. At Sacred Heart Seminary in Hempstead, New York, tests were given middle school children at the time of day that coincided with their time-of-day preferences. The students are bussed from surrounding areas, but share such characteristics as low income, single parent households, and parental transiency. However, with this sole manipulation, mean language arts scores on the Iowa Test of Educational Achievement changed from 8.5 in 1985-1986 to 10.5 in 1986-1987. Dunn & Griggs, pp. 24, 29). The Hutchinson Elementary School, Hutchinson, Kansas, secured statistically higher reading and math scores on the Iowa Basic Skills Tests when students' preferences for both time-of-day and seating design

during the testing situation were given recognition. (Dunn, p. 17).

Another significant report emmanated from the Brightwood Elementary School in Greensboro, North Carolina. Brightwood's student population consists of low socioeconomic Afro-Americans; in 1986, reading and mathematics scores were in the 30th percentile. After one week's training in the Dunn learning style model, the school's principal saw scores on the California Achievement Test climb to the 40th percentile. In 1989, CAT scores rose to the 83rd percentile, thereby surpassing both the system's and the state's average in achievement. It is pointed out that the only change to which these gains can be attributed to was the introduction of the model of learning styles. (Dunn, p. 17).

Certain conclusions may be deduced from these examples of studies in the area under discussion: (1) most research is composed of reports from a single school; (2) because the field is so young, little is known of achievement over time; (3) most reports involve one class and one or two subjects, limiting prospects for comparisons over groups; (4) control groups are largely lacking, severely restricting any opportunities to judge the actual worth of the manipulation process (learning styles models); (5) independent and dependent variables are usually not established firmly. Nonetheless, given these flaws in research design, most teachers, students, and parents are enthusiastic about the utilization of preference in learning styles and they believe it does make an oftentimes dramatic difference in achievement and self-confidence among diverse populations of students.

Summary of Major Points. That individual differences in learning style and cognitive aptitude exist is a well-established fact. In the recent past, theoretical models have been developed in these areas, providing for these differences in the classroom, thereby improving the educational process. In part because of competing theory and models, but also because of the perceived difficulties associated with addressing individual preferences, learning strengths and weaknesses, and other differences in student populations, interest in the concept has mounted slowly among educators. Although other definitions exist, the NASSP explains learning styles as "characteristic cognitive, affective, and physiological behaviors that serve as relatively stable indicators of how learners perceive, interact, and respond to the learning environment." Included are such facets as perceptual modality preferences, preferences for cooperation versus competition and the myriad of personal desires related to the classroom environment. (O'Neil, p. 5) Closely interrelated to learning styles is aptitude treatment interaction, in which some identifiable characteristic of the student, a discernable strength or weakness, is taken into account when selecting the appropriate teaching methodology.

Formal instruments exist for assessing a child's preferred mode of learning. From these assessments, the proper instructional approach and environmental redesign can be devised for each student. These instruments possess variable degress of reliably and validity in terms of the stated purpose. Merely diagnosing style is not

enough; aptitudes are critical also. The overall premise is that all students can learn if styles and aptitudes, the inherent nature of individual difference, are properly addressed. Proponents insist that the wide variety of learning styles and aptitudes can be accomodated in every classroom. Environmental, emotional, sociological, physical, and psychological elements are all involved in the implementation of individualized programs predicated on any of the existent models.

Learning styles research, as well as that dealing with Aptitude Treatment Intervention, has been often composed of doctoral dissertations and reports from individual schools. Thus, large-scale studies stressing experimental and control groups, independent and dependent variables, and well-defined measurements in such areas as long-term gains, are, at present quite rare. It should be noted that most studies detail very significant levels of achievement following incorporation of learning styles preferences. These gains in test score results are significantly high and are reached soon after the program introduction in the classroom. Teachers, students, and parents appear pleased with the changes regardless of the model selected and whether or not instrumentation was involved in the process.

The Implications of Learning Style and Aptitude-Treatment Interaction for One's Own Teaching Practices. Teaching geography in middle school brings its own set of perspectives, problems, and prerequisites to the concept of planning, implementing, and evaluating any

learning style/aptitude treatment interaction project. Given the many available models and approaches to the area, it is critical to select what is most appropriate to the situation, a geography classroom in a middle school. The setting helps establish some perimeters, define actual possibities, and offers a rationale that is practical and "doable" in a real environment.

It is vital to consider one's own preferred learning style/s; this is an idea foreign to many teachers who simply have not evaluated their own approaches to the learning process. Once this is ascertained, via the instrument of choice, it is possible to perceive why one's instruction is biased in a certain direction. Regardless of personal preferences, it is necessary to "stretch" one's own style in order to accomodate those encountered in the typical geography classroom.

To some degree, it is believed that students' individual differences have been addressed prior to actual practice of learning styles and ATI methodologies and strategies. Options have been given in such areas as presentations versus written reports, working at times in pairs, small groups, or larger ones, choices in reading materials pertaining to abilities and interests and so forth. However, these efforts tend to be unfocused when the precise learning style preference and aptitudes of the individual has not been profiled via appropriate instrumentation. Only when detailed profiles are available to both teacher and student will individual needs be adequately met.

Detailed information on the students' needs and preferences allows one to feel more equipped to suggest new methods for studying and learning geography. Various adjustments are possible which should lead not only to higher achievement levels, but to enhanced enjoyment of a course many students deem "boring" or "unnecessary." The learning environment may be expected to be a more positive experience, "not only for our students, but for faculty and parents as well." (Sykes, Jones & Phillips, 1990, p. 24). Although a formal instrument such as The Learning Style Inventory holds definite promise of assessing each student, the research is not so clearly positive as to preclude the teacher's own use of self-prepared checklists, interviews, and questionnaires, together with ongoing observation. The inference must be that the teacher, by virtue of knowing his/her students, is best able to identify learning styles as well as the methods, strategies, and materials that match those styles.

Other implications emerge as well, of value in the middle school geography classroom. Regardless of style, students are still expected to learn. Curriculum goals should remain the same; only how each student will best reach those goals is the point of learning styles analysis. Further, methods and strategies should be matched to the student's strengths and interests as nearly as possible. And, the teacher demonstrates respect for the different learning styles through such mechanisms as differentiating instruction, manipulating the environment, and permitting students to select, when possible, preferred learning settings, approaches, and materials.

Recommendations For Changes the Writer Can Make in Her Instructional Delivery Based on This Information. The writer believes it is not necessary to address all factors of each individual learning style pattern. (Cohen, 1987, p. 17) However, for the approach to honestly recognize and address the learning styles of every student, a wider variety of instructional and environmental strategies must be employed then were previously included. These can be conveniently grouped according to the concept of learning styles as encompassing four areas: environmental, emotional, sociological, and physical. Similarly, learning styles may be focused along six general factors characterizing the individual: (1) the serious, analytical learner; (2) the active, practical learner; (3) observation-centered learner; (4) passive, accepting learner; (5) concrete, detail, fact-oriented learner; and (6) the nonadaptive struggling learner. The writer's instructional delivery must accomodate this perceived diversity in a typical middle school geography classroom.

Instructions should be provided for through individual, peer, teacher-directed, and small and large-group formats. Visuals will be utilized more extensively than previously, encompassing films, videotapes, graphics and so forth. Audio portions of instruction will also be more varied, for example, discussions, whether in general or among groups of differing sizes, lecture, presentations, and audiotapes. Kinesthetic needs are addressed through a more permissive attitude toward movement in the classroom, rearrangements of desks, games, simulations, and role playing as these pertain to geography discussion. In the tactile domain, geography instruction

quite naturally might bring into increased use models, puzzles, and computer software. The writer's goal is to decrease auditory approaches to instructional delivery, in particular, lecture-type presentations, and increase use of the other approaches, thereby better accomodating individual learning styles.

Consistent with curriculum dictates, study units will be formulated that permit students to select the resources by which they will meet the class objectives. This necessitates detailing to the student specific ways in which each objective may be realized. For example, a written book report or a classroom presentation may be equally valid methods of attaining a goal, but each will appeal to a different learning style. Strengths and preferences for individuals are met through such varied techniques. To introduce or reinforce hard-to-understand material, it is probable that Team Learning, Circles of Knowledge, and Brainstorming might prove of worth. Environmental components, while difficult to design, might be altered through allowing students to sit on the floor instead of always at their desks, dimming an area of the classroom, permitting study while listening to music via headsets, and other manipulations of the setting condusive to meeting styles and needs.

It is expected that the writer's repertoire will expand over time, moving away from centering on personal preferences in classroom management to more flexible arrangements. Growth will come about also in utilization of workshops, seminars, and in more informal networking with fellow teachers.

Of course, vital to the implementation of any program is the

evaluation of its effectiveness. Evaluation is important for: (1) ascertaining the extent of gain in achievement; (2) to assess the strengths and weaknesses of the program; and (3) in discovering to what extent a direct result occurred. Pre-testing and post-testing is integral to the process.

The Learning Style Inventory will be administered to all entering students. Through the inventory, coupled with more informal classroom checklists, interviews, and teacher observation, a profile of each student's individual learning style and aptitudes can be constructed. The writer and each student, working cooperatively, will design an approach which, in terms of instructional delivery, environmental concerns, materials, and other relevant factors, addresses those needs, preferences, and aptitudes.

A post-test,covering the general aims of the geography curriculum will be administered at the end of the course. Progress toward the common educational goals by all the students will be assessed, regardless of the learning styles manifested at the beginning of the term. To be determined are: (1) did each student advance satisfactorily toward the common goals; (2) if those students low in aptitude and/or low achieving in other subject areas improved achievement levels; whether teaching to specific learning styles was the only reason for this improvement; (3) if a combination of instructional techniques and deliveries correlated to individual needs, preferences, and aptitudes succeeded in producing higher post-test scores than had been secured with previous classes. Predicated on the reports in the literature, it is expected that such improvements will be recorded via the instruments.

Conclusions: Human Development Theories and Their Role in the Application of Learning Style Methodology in the Classroom. In our studies of human development, a number of theories, it has become apparent that despite the variety of influences that affect it, the process of human development is quite consistent and explicable. Our understanding of human growth and behavior is however complicated by the explanations and predictions of the theorists, whose views often appear contradictory or in actual conflict with one another. Further, when we evaluate a theme, such as how a person should learn, we pass our own judgment on the individual. Brought to bear are our own conclusions, values, and standards, based on our own experiences and environment. Yet, if correctly interpreted, assimilated, and implemented, human development theorists are of real utility in the recognition of learner preferences in the classroom.

Social learning theory, including that of Bandura (1971) stipulates that the individual learns through the experience of coping with his environment. One of social learnings key components is the assumption that people behave in ways likely to produce reinforcement, whether direct, vicarious, or self-administered. The situation is an important determinant of behavior. A person's actions in a given situation depend on the specific characteristics of the situation, the individual's appraisal of the situation, and past reinforcement for behavior in similar situations. What has this theory to suggest regarding learning styles in the middle school classroom?

has an "ideal" environment, within which he may work toward the goal of self-actualization, in Maslow's term for self-fulfillment, or the ideal self as posited in the theories of Rogers.

The psychoanalytic theorists, in particular Erikson (1963, 1968) in his psychosocial view of human development, also adds to our concept of learning styles. The thesis emphasizes early childhood experiences; the sum of these experiences carries over into the classroom, leading to specific needs and the preferences most apt to meet them. In infancy, the individual might have been exposed to certain environmental factors---light, sound--, which became a backdrop, as it were, to learning doing, experiencing. Similarly, the pre-schooler may have been read to or sung to, given much attention or little, interacted with siblings or been an only child. Each component piece, together with a myriad of others, helps to explain why a particular type of learning is favored or disliked.

Another way learning style methodology utilizes human development theory for its successful application in the classroom is via the trait theories. Trait theories attempts to classify kinds of people by assessing personality. Jung (1968), a student of Freud, divided all personalities into introverts and extroverts; the introvert prefers to work alone, the extrovert would rather be part of a team. Too, the introvert would rather turn in a written term paper than report orally in front of the class. A trait refers then to any characteristic in which one individual differs from another in a rather permanent and consistent way.

Conclusions: Human Development Theories and Their Role in the Application of Learning Style Methodology in the Classroom. In our studies of human development, a number of theories, it has become apparent that despite the variety of influences that affect it, the process of human development is quite consistent and explicable. Our understanding of human growth and behavior is however complicated by the explanations and predictions of the theorists, whose views often appear contradictory or in actual conflict with one another. Further, when we evaluate a theme, such as how a person should learn, we pass our own judgment on the individual. Brought to bear are our own conclusions, values, and standards, based on our own experiences and environment. Yet, if correctly interpreted, assimilated, and implemented, human development theorists are of real utility in the recognition of learner preferences in the classroom.

Social learning theory, including that of Bandura (1971) stipulates that the individual learns through the experience of coping with his environment. One of social learnings key components is the assumption that people behave in ways likely to produce reinforcement, whether direct, vicarious, or self-administered. The situation is an important determinant of behavior. A person's actions in a given situation depend on the specific characteristics of the situation, the individual's appraisal of the situation, and past reinforcement for behavior in similar situations. What has this theory to suggest regarding learning styles in the middle school classroom?

The behavioral approach is predicated on certain theses, including the idea of reinforcement. Learning can be rewarded or punished via the stimuli found in the classroom. If the conditions provided meet the preferences of the individual, whether in terms of environmental factors (light or sound), sociological aspects (such as studying by oneself or in a team effort), or physical (being allowed to move around or read on the floor), a reward situation develops, motivating the student to learn on his own terms. Taking an inventory of preferences on learner style permits the conditions that control successful learning habits can be identified, then the stimulus conditions can be changed to meet the stated preferrence. Once the alterations occur, evaluation by observation or more formal measurement procedures will demonstrate if the accomodations have led to increased learning and a happier, more peaceful classroom climate.

Humanistic theories, expressed by Maslow (1970) and Rogers (1970), focuses on the person's view of the world as he perceives it. It is the individual's perceptions and interpretations of experiences that determine behavior, including learning behavior. To understand the individual's behavior, we need to know not only what the external situation is, but how it looks to the person. We must then look to the classroom through the eyes of each student. Each have their own world's view of the environment. Is it properly set up for them? Is the structure formal or informal, for example, may they move around or are they expected to sit quietly and listen? Is the room too quiet or too noisy? Each individual

Direct reinforcement entails, among other aspects, tangible rewards and alleviation of aversive conditions. Rewards might come, depending on individual preference, in such approaches as learning as part of a team or by oneself. (sociological style). Perhaps being allowed to study sitting on the floor rather than at the usual desk could be seen as a reward. (environmental or physical style). Reinforcement assists in motivation, perservering in order to get better grades---whether to please parents or oneself. (emotional style). Alleviation of aversive conditions could include changes in sound, light, and temperature design. Vicariously, perceiving other students experiencing the reward of moving around the room rather than adhering to more rigid formats, will lead to exploration on their part of viable alternatives in learning style. This in turn allows students to discover the conditions that facilitate learning through the rewards they themselves find in the accomodations found in the individualization of instruction and setting. The key validity of behavioral approaches stems from the

has an "ideal" environment, within which he may work toward the goal of self-actualization, in Maslow's term for self-fulfillment, or the ideal self as posited in the theories of Rogers.

The psychoanalytic theorists, in particular Erikson (1963, 1968) in his psychosocial view of human development, also adds to our concept of learning styles. The thesis emphasizes early childhood experiences; the sum of these experiences carries over into the classroom, leading to specific needs and the preferences most apt to meet them. In infancy, the individual might have been exposed to certain environmental factors---light, sound--, which became a backdrop, as it were, to learning, doing, experiencing. Similarly, the pre-schooler may have been read to or sung to, given much attention or little, interacted with siblings or been an only child. Each component piece, together with a myriad of others, helps to explain why a particular type of learning is favored or disliked.

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Piaget (1952) believed that intelligent behavior stems from the child's responsive interaction with the environment and from the perceptual organization that the child imposes on sensory data. Once again, the environment in which learning occurs is of critical import. Learning that has meaning for the student is more permanent and transferable than when it does not. Accomodating learning style contributes to the development of higher thinking skills and processes that figure so heavily in Piagetian theory.

The views of Eysenck (1963) who expanded Jung's thesis is worth noting. In expanding on the idea of introvert-extrovert personality, Eysenck introduced the concept of "stable" "unstable" characteristics. Thus, the extroverted stable person exhibits leadership, is talkative, sociable, and outgoing. The stable introvert is thoughtful, reliable, and careful. Each trait holds implications for the application of learning styles in the classroom. The Eysenck theory is but another way of assessing the individual's preferred environment for learning.

From the above brief comments, it is evident that knowledge of human development is mandatory for the successful introduction of learning styles to the classroom. There are diverse ways of theorizing about the impact of environment on the individual. Each offers ideas for our own unique purpose. All are important in the understanding of characteristic patterns of behavior and thinking that determine a person's adjustment to his environment. Drawing on human development theorists offers insight into performance and behavior dependent on the overall classroom milieu.

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